

Scalable Raid Storage Based on the Structure of Multimedia File

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In professional video production, users have to access to huge multimedia files simultaneously in an error-free environment, this restriction force the use of expensive disk architectures for video servers. Previous researches proposed different RAID systems for each specific task (ingest, editing, file, play-out, etc.). Video production companies have to acquire different servers with different RAIDs systems in order to support each task in the production workflow. The solution has multiples disadvantages; duplicated material in several RAIDs, duplicated material for different qualities, transfer and transcoding processes, etc.

The basic idea of the proposed method is to allow errors in the video file, the method proposed for storage the JPEG2000 images consists in spreading the data in several disk RAID's to adapt the significance of the data in the final image quality with the storage type, the part of data that provide more psnr to the final quality have to be more protected than another. Thus if there are disk failure in a disc RAD, we only lose the quality associated to that part of video, but we can play the clip with the "best effort" quality. In a classical storage, if we have errors in a file, we can't use the file in real time and it is necessary to recover the damage parts. With this approach we show the image under the philosophy: "the most important is to see the image" with the highest possible quality.

The architecture is based in a scalable storage; scalable video means a video which is coded in such a way that subsets of the full video bit stream can be decoded to create scalable low quality/resolution videos. In this method the most important data (the lowest resolution data) have to be stored in the most protected RAID, with this philosophy we don't need to protect all the huge file with the same redundancy, only the high relevance data and not the low. This approach allows having a central storage without duplicate material at different bitrates, each video quality is supported by the previous one and there isn't duplicated material.

With this architecture, an economical method for storage of multimedia professional content applied to JPEG2000 files has been formulated. This method uses several types of RAID configuration and the video file data is decomposed into different files in order to correlate the redundancy with importance of the data. The global storage can be used in all the different tasks of the production workflow saving disk space, redundant files and transfers procedures.

This method opens a wide range of future work:

- A new architecture of video servers.
- Investigation of areas which are really necessary in each one of the headers to reduce as much as possible the file to be stored as main.
- Implementation of an HW model which speeds up separation and union of files.
- Application of the method to other types of files and code systems.

